Biofuels news
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## FOCUS ON...

### *Collaboration - the Path to Success*

***From power to plastic, federal agencies are working together to create new and exciting biobased products. Research to create biofuels can also be applied to other industries such as chemicals and plastics. The Biofuels Program, as part of DOE's Office of Fuels Development, actively collaborates with other government organizations such as the U.S. Department of Agriculture (USDA) and DOE's Office of Industrial Technologies.***

Combine the USDA's expertise in creating ethanol from cornstarch with DOE's experience in making ethanol from lignocellulosic feedstock, such as corn stover, and what do you get? Synergy! When DOE Biofuels Program researchers went looking for information to help them model the emerging lignocellulose-to-ethanol industry, they knew that the more mature corn-to-ethanol industry would be a good place to start. Recognizing that this was an opportunity to develop a stronger partnership with USDA, Biofuels Program researchers approached researchers at the USDA about a joint project that would take advantage of the expertise and experience of each agency.

DOE's Biofuels Program actively promotes the development of technologies to allow the production of ethanol from lignocellulosic feedstocks such as corn stover. Important elements of this work include the development of better ethanol-fermenting organisms, conducting engineering studies of potential processes, and building lignocellulose-to-ethanol demonstration facilities. This research is being carried out by various national laboratories, including the National Renewable Energy Laboratory (NREL) and Oak Ridge National Laboratory (ORNL), universities, and private industry.

At the same time, USDA has been actively seeking to develop the corn-ethanol industry. Its research has focused on establishing high-value ethanol co-products and various methods for improving corn-ethanol process efficiencies. This research is being conducted primarily by USDA's Agricultural Research Service (ARS) and the Cooperative State Research, Education, and Extension Services (CSREES). Additional research into ethanol economics and policy is being conducted by USDA's Office of Energy Policy and New Uses (OEPNU), and the Economic Research Services (ERS).

The DOE-USDA collaboration has resulted in a two-phase project to evaluate ethanol economics and process design. Phase 1 focused on developing a cost analysis for producing ethanol from both cornstarch and lignocellulosic feedstocks. This part of the project resulted in the publication of the report *"Determining the Cost of Producing Ethanol from Corn Starch and Lignocellulosic Feedstocks"* in October 2000 *(www.nrel.gov/docs/fy01osti/28893.pdf)*.

Phase 2 of the project, which is expected to result in a report later this year, focuses on the feasibility of combining the starch-to-ethanol and lignocellulose-to-ethanol processes by co-locating processing plants. So far, the DOE-USDA collaboration has worked extremely well and researchers at DOE are looking forward to future joint efforts with USDA.

Warren Gretz, NREL/PIX09926

***One of the most exciting developments in biobased products is the result of a DOE/Cargill Dow LLC industry partnership, through which Cargill Dow has built the technology to create polylactide polymers (PLP) from biomass feedstocks. These PLPs can be used to create a variety of biodegradable plastic products, including packaging and textiles.***

# In the Spotlight

## *A Conversation with Doug Kaempf*

Doug Kaempf /PIX 00928

When Congress passed the Biomass Research and Development Act, it recognized that interagency cooperation is a key component in developing exciting new biobased products. Currently eleven federal agencies or departments participate in the Biobased Products and Bioenergy Initiative, including the USDA and DOE. For more information on the initiative, please visit *www.bioproducts-bioenergy.gov/*.

Douglas E. Kaempf is the newly appointed DOE Co-Director of the National Biobased Products and Bioenergy Coordination Office. Kaempf will be working directly with the Assistant Secretary of Energy Efficiency and Renewable Energy as Senior Advisor on Bioenergy. He has worked closely with other Federal agencies, industry and stakeholder groups, and state governments in his previous position as Director in the Office of Industrial Technologies.

Kaempf recently took a few moments to talk to *Biofuels News* about the future of biofuels and biobased products research and development.

***BIOFUELS NEWS: How do you expect the Biobased Products and Bioenergy Initiative to affect the overall level of interagency collaboration?***

**DOUG KAEMPF:** "I think it's really clear from the Biomass R&D Act that the administration expects this to be an integrated effort not only between DOE and USDA, which are the primary agencies involved, but also with other agencies like the EPA and the National Science Foundation. It is very clear that we will need to work together to leverage resources and the act has set up the infrastructure to let us do that.

We've set up a technical advisory committee that's chartered to provide DOE and USDA with recommendations for technical focus, strategy, and partnerships. They're coming up with a unique portfolio that will help effectively implement the act and justify budget requests. We also have a R&D board made up of eleven of the federal agencies or departments that will implement the portfolio.

The R&D board put together a publication called "Fostering the Bioeconomic Revolution," that should be out in a couple of weeks. There was really an integrated effort across those participating in the R&D Board and it complements the bioenergy roadmap being developed by industry.

There are still some barriers to integration. Now we're talking about how we might be able to do joint solicitations—try to take that next step to true integration through things like co-funding certain research areas."

***BIOFUELS NEWS: What do you see happening in biobased products and bioenergy research over the next few years?***

**DOUG KAEMPF:** "I see, personally, energy efficiency and renewable energy as part of the solution to our energy problems. Biomass is a major resource that is available in the United States and that, in many ways, has not been taken advantage of. If you look at what the President says about a national energy policy, you'll see that he mentions things like promoting alternative energy sources, energy security, and the environment, and bioenergy can help meet those needs. The technologies for biopower, biofuels, and many bioproducts are there, but there are policy issues that still need to be addressed for longer-term progress. Technology improvements will lower costs, which is important, but the bottom line for biopower is that it's more environmentally friendly than the burning of fossil fuels. Some people will say that you're still burning something with biofuels, and that's true. There isn't a totally clean way of producing power, but when you compare bio to fossil fuels you can see that bio is a large step in the right direction. Is it the only way? No. We're doing great work toward things like fuels cells, but biopower is a strong step in right direction."

***BIOFUELS NEWS: What is your long-term vision for biobased products generally and biofuels in particular?***

**DOUG KAEMPF:** "My long-term vision is the biorefinery, which I think you'll see once the feedstock and technology issues are resolved. Of course, we want to keep fields fertile and we want to protect wildlife so those issues will need to be addressed, but in long term, having bio-refineries as part of distributed energy resources makes sense. I see the biorefinery as something that would help not only the agricultural community but the entire rural community. The potential is there to give farmers another cash crop

that is value added and that could perhaps be put on less specialized or marginal ground.

Bioenergy needs to be part of the distributed energy solution. It has the promise of reducing some very serious environmental problems associated with livestock and poultry waste while providing heat and electricity generation and providing fertilizers as an end product. It's a win-win scenario. What I really see is not trying to replace petroleum but moving bio forward as an alternative to petroleum.

Energy security is another big problem that bioenergy can help with. I have two young children and worry about what their lifestyle will be like in the future. So I think it's important to use as many domestic resources as we can. It's important to remember that the possibilities of bio aren't limited to duplicating petroleum products—though that's mainly what we're doing now. What I'll get really excited about will be products that are unique to bio and that will require bio for production."

***BIOFUELS NEWS: How will the initiative work with private industry to build the biofuels market?***

**DOUG KAEMPF:** "We started working with hundreds of companies and with industry associations to develop a bio-vision and bio-roadmap and we take their input very seriously. We've had input from industry and federal agencies and we will use it as our guide for where we are going to go from here. Industry is really leading the way here. They developed the roadmap that the advisory committee will use to build the research portfolio. We'll have competitive solicitations on research areas they identified as important and use existing programs at USDA and elsewhere to move products into commercial use.

I do believe that there are so many enthusiastic companies out there that they will make this happen. The federal role will be to reduce risk and allow them to try new things."

***BIOFUELS NEWS: How will biobased products and bioenergy fit into the goals of the new administration?***

**DOUG KAEMPF:** "The President raised six points in his energy policy, including protecting the environment, building energy security, and decreasing dependency on foreign energy sources. Bioenergy has what it takes to be a strong part of his plan.

Secretary Abraham has made it clear that he wants to increase the use of renewable energy. Bio is a good fit but isn't the whole solution. The president has made it clear that he will continue to look for new sources of energy in America and we are a strong part of that."

## *OTT and OIT: A Shared Vision*

DOE's Office of Transportation Technologies (OTT) Biofuels Program and the Office of Industrial Technologies (OIT) Agriculture Industry of the Future Program share a commitment to developing technologies that advance the use of biobased products. While OTT focuses on ways to create transportation fuel from biomass, OIT has become increasingly involved in using biomass to make a variety of chemicals and polymers.

Warren Gretz, NREL /PIX 03296

Both offices are actively working within DOE's Bioenergy Coordination Office to find innovative ways to utilize biomass resources, address environmental issues, and spur demand for U.S. agricultural products. The DOE Bioenergy Initiative vision involves integrating the biofuels, bioproducts, and biopower industries to be an essential component of creating a viable bioindustry *(www.eren.doe.gov/bioenergy_initiative/page10.html)*. Through partnerships with national laboratories such as Pacific Northwest National Laboratory (PNNL), NREL, and ORNL, and collaboration with industry and universities, the technologies necessary to create products such as biobased plastics, chemicals, and fuels are advancing rapidly.

NYSERDA /PIX 07706

## ITEM OF INTEREST

**Share your opinion on the ethanol fuel tax subsidy by participating in Tech Central's Enviropoll at:**

***www.techcentralstation.com/environment.asp.***

Oak Ridge National Laboratory/PIX 09927

## *A History of Collaboration*

The USDA and DOE's Oak Ridge National Laboratory (ORNL) have a long history of successful joint projects.

- ORNL and the National Renewable Energy Laboratory (NREL) are currently working with the USDA Agricultural Research Service to study the use of corn stover for energy production. This research is part of an effort to develop environmentally sustainable harvesting systems for corn stover.
- Economic models developed with the USDA and the University of Tennessee are improving the understanding of energy crops including expected yields and estimated crop production.
- Switchgrass breeding projects involving ORNL and the Lincoln Nebraska Cooperative State Research, Education, and Extension Service (CSREES) are increasing its suitability to be an ethanol feedstock.

For more information about joint ORNL/USDA projects, please visit *www.bioenergy.ornl.gov/reports/ misc/bfpd_status_2000.html.*

## DID YOU KNOW?

## *Upcoming Conferences*

***1st World Biofuels Conference Renewable Fuels The Way Forward***
*April 3-4, 2001, Paris, France*
*www.agra-net.com*

***23rd Symposium on Biotechnology for Fuels and Chemicals***
*May 6-9, 2001, Breckenridge, CO*
*http://www.nrel.gov/biotech_symposium*

***The Fifth Biomass Conference of the Americas***
*Sept. 17-21, 2001, Orlando, FL*
*www.nrel.gov/bioam/*

**FOR OTHER UPCOMING CALENDAR EVENTS SEE:**
*www.afdc.doe.gov/cgi-bin/comingevents/events.cgi?biofuel*

**NEW DOE OFFICE OF FUELS DEVELOPMENT PUBLICATIONS:**

***Corn Stover for Bioethanol – Your New Cash Crop?***
*www.afdc.doe.gov/pdfs/5199.pdf*

***Bioenergy Feedstock Development Program Status Report***
*www.bioenergy.ornl.gov/reports/misc/bfpd_status_2000.html*

***Bioenergy Feedstock Development Program Overview for 2001***
*www.bioenergy.ornl.gov/papers/misc/bfdpoverview2001.html*

***Bioethanol – Moving into the Marketplace***
*www.afdc.doe.gov/pdfs/4836.pdf*

***The DOE Bioethanol Pilot Plant – A Tool for Commercialization***
*www.nrel.gov/docs/fy00osti/28397.pdf*

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Don't forget to register your e-mail address to get future e-mail only issues at *www.ott.doe.gov/biofuels/* BF News subscribers.
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DOE National Biofuels Program
National Renewable Energy Laboratory
1617 Cole Blvd., MS-3511
Golden, CO 80401

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